

CLAIMS

1. Air conditioning equipment comprising:

a heat exchanger that exchanges heat between refrigerant of a

5 refrigeration cycle and air;

a fan that fans air to the heat exchanger;

an air duct in which the fan is installed and through which an acoustic wave propagates; and

a plurality of small holes that blows a jet to the air duct, and sucking

10 a jet from the air duct according to a pressure difference between a blow side and a suction side of the fan.

2. The air conditioning equipment according to claim 1, wherein the

blow side and the suction side of the fan is separated by a solid wall, and

15 wherein the plurality of small holes is provided on the solid wall.

3. The air conditioning equipment according to claim 2, wherein the air

conditioning equipment is a ceiling cassette type air conditioner, and

wherein the plurality of small holes is provided on a decorative

20 panel.

4. The air conditioning equipment according to claim 2, wherein the air

conditioning equipment is a ceiling cassette type air conditioner, and

wherein the plurality of small holes is provided on a guide of the fan.

5. The air conditioning equipment according to claim 1, comprising:

a first air duct in which the fan and the heat exchanger are installed;

a plurality of small holes provided on at least one of a wall of a

5 position on the blow side of the fan and a wall of a position on the suction side of the fan; and

a second air duct linking one of the plurality of small holes and another of the plurality of small holes or linking the plurality of small holes and an opposite side to the suction side or the blow side of the fan on which
10 the plurality of small holes is provided.

6. The air conditioning equipment according to claim 1, comprising:

a first air duct in which the fan and the heat exchanger are installed;

15 a large number of small holes provided on one of a wall of a position of the blow side of the fan and a wall of a position of the suction side of the fan;

a small number of big diameter holes provided on an other of the wall of the position on the blow side of the fan and the wall of the position
20 on the suction side of the fan; and

a second air duct linking the large number of small holes and the small number of big diameter holes.

7. The air conditioning equipment according to claim 6, comprising:

25 a plurality of small ducts installed on the blow side of the fan, the

plurality of small ducts including the large number of small holes.

8. The air conditioning equipment according to claim 5, wherein the plurality of small holes or the large number of small holes are provided in a position near the fan.
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9. The air conditioning equipment according to claim 5 or 6, wherein the second air duct is installed outside the first air duct.
10 10. The air conditioning equipment according to claim 5, wherein the second air duct is installed inside the first air duct.
11. The air conditioning equipment according to claim 5 or 6, wherein the air conditioning equipment is an air conditioning outdoor unit,
15 wherein the air conditioning outdoor unit includes a compressor in a housing, and
wherein an acoustic wave from the compressor propagates through the air duct.
20 12. The air conditioning equipment according to claim 1, 2, 5, or 6, wherein a diameter of each of the small holes is up to 10mm.
13. The air conditioning equipment according to claim 1, 2, 5, or 6, wherein an open area ratio of the small holes is up to 10% where the open
25 area ratio is a ratio of a total cross-sectional area of the small holes to a

cross-sectional area of the wall of the air duct.

14. Fan equipment comprising:

a fan blade that fans air;

5 an air duct in which the fan blade is installed and through which an acoustic wave propagates; and

a plurality of small holes that blows a jet to the air duct and sucking a jet from the air duct according to a pressure difference between a blow side and a suction side of the fan blade.

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15. The fan equipment according to claim 14, comprising:

a first air duct in which the fan blade is installed;

a plurality of small holes provided on at least one of a wall of a position on the blow side of the fan blade and a wall of a position on the

15 suction side of the fan blade; and

a second air duct linking one of the plurality of small holes and another of the plurality of small holes or linking the plurality of small holes and an opposite side to the suction side or the blow side of the fan blade on which the plurality of small holes is provided.

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16. The fan equipment according to claim 14, further comprising:

a first air duct in which the fan blade is installed;

a large number of small holes provided on one of a wall of a position of the blow side of the fan blade and a wall of a position of the suction side

25 of the fan blade;

a small number of big diameter holes provided on an other of the wall of the position on the blow side of the fan blade and the wall of the position on the suction side of the fan blade; and
a second air duct linking the large number of small holes and the
5 small number of big diameter holes.

17. The fan equipment according to claim 15 or 16, wherein the small holes are provided in a position near the fan blade.

10 18. The fan equipment according to claim 15 or 16, wherein the second air duct is installed outside the first air duct.

19. The fan equipment according to claim 15 or 16, wherein the second air duct is installed inside the first air duct.

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20. Fan equipment comprising:

a fan blade that fans air;
an air duct in which the fan blade is installed and a distance between a blow side of the fan blade and an exit of the air duct is
20 substantially long; and
a plurality of small holes provided on a wall near the blow side of the fan blade.

21. Fan equipment comprising:

25 a fan blade that fans air;

an air duct in which the fan blade is installed and a distance between a suction side of the fan blade and an entrance of the air duct is substantially long; and

- a plurality of small holes provided on a wall near the suction side of
5 the fan blade.

22. Fan equipment comprising:

a fan blade that fans air:

- an air duct in which the fan blade is installed and through which an
10 acoustic wave propagates; and
a passage barrier installed on at least one of a blow side and a
suction side of the fan blade, the passage barrier including a plurality of
small holes, and the passage barrier formed in close contact with the air
duct on an upstream side and formed so that air blows through a narrow
15 passage on a downstream side.

23. Fan equipment comprising:

a fan blade that fans air:

- an air duct in which the fan blade is installed and through which an
20 acoustic wave propagates; and
a passage barrier installed on at least one of a blow side and a
suction side of the fan blade, the passage barrier including a plurality of
small holes, and formed in close contact with the air duct on an downstream
side and open on an upstream side.

24. The fan equipment according to claim 15, 16, 20, 21, 22, or 23,
wherein a diameter of each of the small holes is up to 10mm.

25. The fan equipment according to claim 15, 16, 20, 21, 22, or 23,
5 wherein an open area ratio of the small holes is up to 10% where the open
area ratio is a ratio of a total cross-sectional area of the small holes to a
cross-sectional area of the wall of the air duct.

26. A noise reduction method of equipment in which a fan that funs air
10 to an air duct is installed, the noise reduction method comprising:

blowing a jet to the air duct through a plurality of small holes
according to a pressure difference that is one of between a blow side and a
suction side of the fan and between the blow side or the suction side of the
fan and outside the air duct; and

15 sucking in a jet from the air duct according to the pressure
difference.

27. Pressure pulsation reduction equipment of refrigeration cycle
equipment, comprising:

20 a refrigeration cycle including a compressor; and
a pressure pulsation reducer, which is installed on at lease one of a
high pressure side and a low pressure side of the refrigeration cycle, the
pressure pulsation reducer including a passage barrier with a plurality of
small holes, and the passage barrier formed open on one end and in close
25 contact with a passage wall on an other end.

28. The pressure pulsation reduction equipment of refrigeration cycle equipment according to claim 27, comprising:

a pressure pulsation reducer, which is installed on at lease one of a
5 discharge side and a suction side of the compressor, the pressure pulsation reducer including a passage barrier with a plurality of small holes, and the passage barrier formed open on one end and in close contact with a passage wall on an other end.

10 29. The pressure pulsation reduction equipment of refrigeration cycle equipment according to claim 27, comprising:

a pressure pulsation reducer, which is installed in an oil separator that is incorporated with the compressor, the pressure pulsation reducer including a passage barrier with a plurality of small holes, and the passage
15 barrier formed open on one end and in close contact with the oil separator on an other end.

30. Pressure pulsation reduction equipment of refrigeration cycle equipment, comprising:

20 a refrigeration cycle including a compressor; and
a pressure pulsation reducer including a plurality of small holes provided on pipeline walls on a discharge side and a suction side of the compressor, the plurality of small holes on the discharged side of the compressor and the plurality of small holes on the suction side of the
25 compressor linked by a connection pipe.

31. The pressure pulsation reduction equipment of refrigeration cycle equipment according to claim 27, 28, 29, or 30, wherein a diameter of each small hole of the plurality of small holes is up to 10mm.

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32. The pressure pulsation reduction equipment of refrigeration cycle equipment according to claim 27, 28, 29, or 30, wherein an open area ratio of the plurality of small holes is up to 10% where the open area ratio is a ratio of a total cross-sectional area of the plurality of small holes to a cross-sectional area of the passage wall.

10 33. Pressure pulsation reduction equipment of pump equipment, comprising:

15 a pressure pulsation reducer, which is installed on at least one of a discharge side and a suction side of the pump equipment, the pressure pulsation reducer including a passage barrier with a plurality of small holes in a passage of a medium, and the passage barrier formed open on one end and in close contact with a passage wall on an other end.

20 34. Pressure pulsation reduction equipment of pump equipment, comprising:

a pressure pulsation reducer including a plurality of small holes provided on pipeline walls on a discharge side and a suction side of the pump equipment, the plurality of small holes on the discharge side of the pump equipment and the plurality of small holes on the suction side of the

pump equipment linked by a connection pipe.

35. Pressure pulsation reduction equipment of pump equipment,
according to claim 33 or 34, wherein a diameter of each of the small holes
is up to 10mm.

36. Pressure pulsation reduction equipment of pump equipment,
according to claim 33 or 34, wherein an open area ratio of the plurality of
small holes is up to 10% where the open area ratio is a ratio of a total
10 cross-sectional area of the plurality of small holes to a cross-sectional area
of the passage wall.

37. A pressure pulsation reduction method of equipment in which one of
a compressor and pump equipment discharging a medium to a medium
15 passage is installed, the pressure pulsation reduction method comprising:

blowing a jet to the medium passage through a plurality of small
holes according to one of a pressure difference between a discharge side
and a suction side of the one of a compressor and pump equipment and a
pressure difference that occurs in the medium passage of the one of the
20 compressor and the pump equipment; and

sucking in a jet from the medium passage according to the one of
the pressure differences.